Source Water Assessment Program (SWAP) Report for Monument Mountain Regional High School

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supply sources;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
June 18, 2001

Table 1: Public Water System (PWS) Information

PWS Name	**Monument Mountain Regional High School**
PWS Address	**662 Stockbridge Street**
City/Town	**Great Barrington, Massachusetts**
PWS ID Number	**1113016**
Local Contact	**Director of Operations, John R. Komer**
Phone Number	**413-528-2410**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well # 1	1113016-01G	236	579	High
Well # 2	1113016-02G	100	420	High

INTRODUCTION

We are all concerned about the quality of the water we drink. Many potential contaminant sources, including septic systems, road salt and improperly disposed of hazardous materials may threaten the quality of water from drinking water wells. Citizens and local officials can work together to better protect drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential contaminant sources, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. DESCRIPTION OF THE WATER SYSTEM

The Wells
Monument Mountain Regional High School is a rural regional school located on the east side of Route 7 in Great Barrington with a staff and student population of approximately 650 people. There are two water supply wells at the school. Well #1 is the main water supply for the school; well #2 supplies water to the greenhouse, its associated classroom and work areas.

Well 1, an 8-inch diameter well drilled to a depth of approximately 225 feet below ground in 1967. School records indicate difficulty drilling the well due to collapse of the formation. Bedrock was encountered at 4 feet below grade but the casing was extended to 200 feet below grade; the well casing extends approximately 18-inches

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.

- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

above the floor of a below ground vault. Although there was dampness on the floor, there was no evidence of flooding in the vault. The yield for Well 1 was estimated to be approximately 145 gpm based on a pumping test conducted at the time of construction. Well 2, a 6-inch diameter well is located in a crawl space accessed from the basement of the Plant Science classroom building. There is no information about the depth or construction of the greenhouse well although there is anecdotal information regarding an estimated yield of approximately 200 gallons per minute. This information could not be confirmed.

It is assumed that both wells are completed in bedrock. Geological maps of the area describe the bedrock as the Stockbridge Formation. The bedrock mapped at the greenhouse well is massive dolomite marble while the school well is mapped near the contact between the dolomite marble and layered, impure quartzose, micaceous dolostone. The structural geology map of the site shows fairly complex folding and faulting mapped both east and west of the well locations with nearly vertical bedding planes in the vicinity of the wells. The bedrock aquifer utilized by the two school wells has a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration from the ground surface into the aquifer.

Well 1 has a Zone I protective radius of 236 feet and an Interim Wellhead Protection Area (IWPA) radius of 579 feet based on metered water usage. Well 2 has a Zone I radius of 100 feet and an IWPA radius of 420 feet based on an daily use estimates from Title 5, septic system design flow criteria. Please refer to the attached maps of the Zone Is and IWPAs and Tables 2 and 3 for more assessment information.

The Water Quality
For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1.

2. DISCUSSION OF LAND USES IN THE PROTECTION AREAS

A number of land uses and activities within the drinking water supply protection areas for Monument Mountain Regional High School wells are potential sources of contamination. The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the Zone I and IWPA, as seen in Tables 2 and 3.

Table 2: Table of Activities Within the Protection Areas

Potential Sources of Contamination*	Zone I	IWPA	Threat	Comments
Hazardous materials storage	Well 2	Both Wells	High	Laboratories/auto repair/greenhouse
Transportation corridor (Route 7)	Well 2	Both Wells	Moderate	Road salt, spills and runoff
Parking lots and driveways	Both Wells	Both Wells	Moderate	Limit road salt usage and provide drainage away from wells
Wastewater pipelines/septic components	Both Wells	Both Wells	Moderate	Wastewater mains, tank and leachfield
Stormwater discharge	No	Both Wells	Low	Road salt, spills and runoff
Landfill	No	No	--	The landfill is closed. There is no confirmed impact on the wells from the landfill.

*** - For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Key Land Use Issues for the Wells include:

1. **Non-conforming uses in Zone I**
2. **Wastewater components**
3. **Hazardous Materials handling**

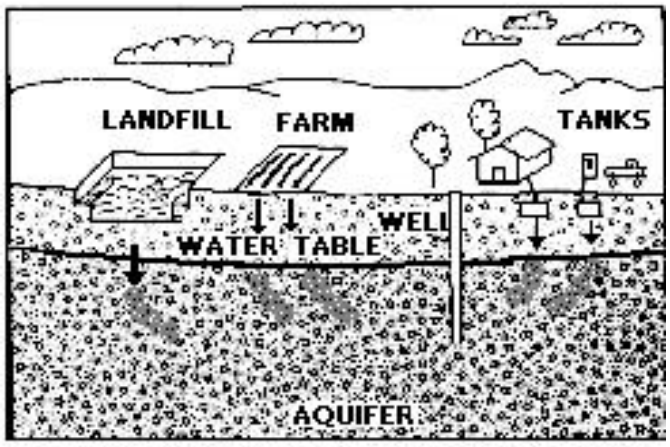

Figure 1: Example of how a well could become contaminated by different land uses and activities.

1. **Zone Is –** Both wells are non-conforming with respect to MA DEP land use restrictions, which allow only water supply related activities in Zone Is. The Zone Is for Wells 1 and 2 contain parking, school buildings and activities, sewer lines, septic tank (Well 1) and leachfield (Well 2), storm drains and Route 7. Please note that systems not meeting DEP Zone I requirements must receive DEP approval and address Zone I issues prior to increasing water use, modifying systems or conducting any activities within Zone I.

   Recommendation:

   ✓ Do not conduct any additional activities within the Zone I. Monitor all activities within Zone I, use BMPs and training for emergency response.

   Contact MA DEP prior to conducting any new activities within Zone I. Consider replacement of sources or an alternative source of water if existing land uses cannot be mitigated. Contact the Department to discuss any expansion of the school well in advance of finalizing plans.

2. **Wastewater components -** The septic tank, kitchen grease trap and sewer lines are within the Zone I of Well 1. The tank for the greenhouse is within the Zone I for Well 2; the leachfield for the school is partially within the IWPA of Well 2. The

Table 3: Activities Specific to Well #1

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Underground Heating Oil Storage Tank (UST) (Unused)	Yes	No	High	The USTs is a backup to the propane and is not currently used.
High School	Yes	Yes	Moderate	Non-water supply structures in Zone I. Small quantities of hazardous materials are used and generated.
Floor drains (Underground Injection Control – UIC)	-	-	-	Discharge point for floor drain in auto mechanics shop and boiler room must be investigated and addressed.

Activities Specific to Well #2 – Greenhouse Well

Potential Sources of Contamination	Zone I	IWPA	Threat	Comments
Greenhouse - Pesticides and fertilizers	Yes	Yes	High	Containment and use must be managed.
Leachfield	No	Yes	Moderate	Laboratory and art wastes must be eliminated from waste stream.
Lawns and athletic fields	Yes	Yes	Moderate	Do not use pesticides or fertilizers.
Floor drains (Underground Injection Control – UIC)	-	-	-	Discharge point for floor drain greenhouses - investigate and address.

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400 foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on DEP's web site at: www.state.ma.us/dep/brp/dws.

school currently has until 2003 to acquire a groundwater discharge permit for the large Title 5 system. The school has active high school science (biology and chemistry) laboratories, art classes and an auto mechanics shop with a floor drain. The Plant Science Building also has greenhouses with floor drains. The discharge point for the floor drains is unknown. Title 5 prohibits disposal of non-sanitary wastewater into a Title 5 system. The alternatives for the floor drains include closure, connection to a tight tank or connection to the municipal sewer system with an oil water separator as appropriate. The options for the laboratory and art wastes include, connection to either a tight tank or municipal sewer.

Recommendations:

- ✓ Review the information attached regarding the proper methods for closure of floor drains (refer to attachment 4 - *Industrial Floor Drain Brochure*).
  Contact the UIC coordinator for the Western Regional Office of the Department for additional technical assistance - (Rick Larson (413) 755-2207).
  Interim actions:
  - Cease using the floor drain immediately
  - Determine the discharge point of the floor drain, investigate as appropriate
  - The school is currently investigating the feasibility of connecting to the Great Barrington sewer system. Connecting to the sewer will resolve several issues for the school and add significant protection to the water supplies.

3. **Hazardous Materials Handling –** The school has science laboratories, art class studios and an auto shop. The volumes of potentially hazardous materials used and disposed of will likely require the school to register at a Very Small Quantity Generator (VSQG) of Hazardous Waste. Hazardous materials disposed of through the leachfield have the potential to impact the groundwater.

   Recommendations:

   - ✓ Review the requirements for registration as a VSQG. To learn more, see the hazardous materials guidance manual at www.dep.state.ma.us/dep/bwp/dhm/dhmpubs.htm.
   - ✓ Contact Hillary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or Hilary.Eustace@state.ma.us. Ms. Eustace will be able to provide assistance in preparing an inventory and plan for managing hazardous materials and waste at the school, specifically art, science and automotive technology products and waste.

Other activities identified during the assessment that pose a potential threat to the water supplies are the landfill, residential septic systems and household hazardous waste. The landfill was extensively studied at the time of closure. There was no confirmed impact on the schools well water quality. For further information regarding the landfill studies, contact the Springfield Office of the DEP's Division of Solid Waste at (413) 784-1100. Storm water discharges are within the IWPA of both wells. Use of BMPs and monitoring of parking areas will minimize the potential threat from parking lot runoff. With respect to the unused underground fuel oil storage tank, it should be determined if there is fuel in the tank. The tank should periodically be monitored or removed if there is no intent to use the tank. If the intent is to have an oil tank for a back-up fuel source, it is recommended to upgrade the tank to current standards. The schools utility transformer(s) are located in the school. Contact the utility to ensure only PCB free oil is in the transformers.

Implementing the recommendations below will reduce the system's susceptibility to contamination.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been provided to the water supplier, town boards, the town library and the local media.

3. PROTECTION RECOMMENDATIONS

Monument Mountain Regional High School should review and adopt the following recommendations at the facilities:

Zone I:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Consider connecting the facility to the Great Barrington sewer and public water systems.
- ✓ Please note that water systems not meeting DEP Zone I requirements must get DEP approval and address Zone I issues prior to increasing water use, modifying their system or conducting any additional non-conforming activities in Zone I.
- ✓ Consider well relocation if Zone I threats cannot be mitigated.
- ✓ Prohibit public access to the well by locking facilities, gating roads, and posting signs.
- ✓ Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of vandalism, check for accidental spills or leaks, etc.
- ✓ Consider alternative sites for a new well and protect that land for future use through purchase or conservation restriction that would prohibit potentially threatening activities.
- ✓ Coordination with the DEP, State highway and local officials regarding protecting the water supplies through emergency response coordination.
- ✓ Well 1 is in a vault/pit. Generally pit installations for water supply wells are not approved by the Department due to the safety concerns associated with confined spaces, as well as the potential for the flooding of the Wellhead that could affect sanitary quality of the water being delivered. Consider extending the Wellhead to 18-inches above the ground as part of future modifications to Well 1. Unless the turbine pump is replaced with a submersible, this change would require the construction of a pump house as well.
- ✓ The unused underground fuel oil storage tank should be inspected, drained and removed if there is no intent to use the tank. Upgrade the tank to current standards if the intent is to have an oil tank for a back-up fuel source.

Training and Education:

- ✓ Train staff and faculty on proper hazardous material use, disposal, handling, emergency response, and best management practices; include custodial staff, certified operator, faculty and other appropriate staff.
- ✓ Maintain the drinking water protection area signs at key visibility locations.

Facilities Management:

- ✓ Implement standard operating procedures regarding proper storage, use and disposal of hazardous materials. To learn more, see the hazardous materials guidance manual at www.state.ma.us/dep/bwp/dhm/dhmpubs.html. Also, contact Hillary Eustace of the Massachusetts Office of Technical Assistance at 617-626-1061 or Hilary.Eustace@state.ma.us.
- ✓ Monitor all oil/hazardous material storage tanks to incorporate proper containment and safety practices.
- ✓ Implement Best Management Practices (BMPs) for the use of pesticides on facility property.
- ✓ The utility transformers are located in the basement of the school. Contact the utility company to determine if the MODF has been replaced with PCB free oil. If PCBs are present, urge their immediate replacement.

Planning:

- ✓ Work with local officials in Great Barrington to include the facility IWPA in Aquifer Protection District Bylaws and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a potential contaminant threat inventory to assist in setting priorities, focusing inspections, and creating educational activities.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to spur discussions to assist the water supplier in his efforts to protect and improve the water supply and further review overall local drinking water protection measures.

4. ATTACHMENTS

- Map of the Public Water Supply (PWS) Protection Area.
- Septic System Brochure
- Summary of Recommended Source Water Protection Measures
- The Very Small Quantity Generator of Hazardous Waste – Fact Sheet
- One Day Hazardous Waste Collections - Fact Sheet

Additional Reference Documents:

To help with source protection efforts, more information is available from the Regional Office by contacting Catherine V. Skiba (413) 755-2119 or online at www.state.ma.us/dep/brp/dws, including:

- Water Supply Protection Guidance Materials such as model regulations
- Developing a Local Wellhead Protection Plan
- Best Management Practice information, and general water supply protection information
- MA DEP SWAP Strategy
- Land Use Pollution Potential Matrix
- Draft Land/Associated Contaminants Matrix